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**BARCELONATECH**

**Escola Superior d'Enginyeries Industrial,  
Aeroespacial i Audiovisual de Terrassa**

# Study of the Active Flow Control of an Airfoil

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## BUDGET

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## 0.1 Introduction

In this document the economic aspects of the thesis *Study of the Active Flow Control of an Airfoil* are presented.

Given the computational nature of this thesis, the main costs are located in the human and the computational resources .

## 0.2 Technical Cost

All incurred technical costs are on human resources. With a gross cost of 25€/per hour, Table 1 presents how much each task cost time-wise and money-wise, as well as the total.

Task	Hours (h)	Cost per hour (€/h)	Final cost (€)
Learn to use GMSH	15	25	375
Project charter	10	25	250
Baseline mesh production	40	25	1 000
Learn to use openFOAM	20	25	500
Baseline case setup	20	25	500
Learn to use ParaView	10	25	250
Baseline case analysis	25	25	625
Actuated mesh production	5	25	125
Actuated case setup	5	25	125
Actuated case analysis	25	25	625
Boundary layer analysis	55	25	1 375
Write the report	70	25	1 750
<b>Total</b>	300	25	7 500

TABLE 1: Technical cost

### 0.3 Execution Cost

As for execution costs, all software used has been at zero cost. The PC is considered to have a lifespan of 3 years, whereas the Casio calculator a lifespan of 20 months. Both machines are to be used for the whole 4 months. As for the electricity, the power consumption of the PC has been estimated to 400 Wh, with a cost per hour of 5 cents.

Hardware	Cost per unit (€)	Amortization (%)	Final cost (€)
Casio fx-991SP X Iberia	28	20	5
Custom desktop PC	3 500	11.1	389
Software	Cost per month (€)	Months (m))	Final cost (€)
Matlab student license	0	3	0
Overleaf	0	4	0
GMSH	0	4	0
openFOAM	0	4	0
ParaView	0	3	0
Electricity	Cost per hour (€/h)	Hours (h)	Final cost (€)
Desktop PC daily	0.05	300	15
Desktop PC CFD	0.05	455	23
<b>Total</b>	—	—	432

TABLE 2: Execution cost

### 0.4 Summary

The total cost of this work is valued at 7 932 €between technical and execution costs.